

Research into financial and Institutional structures to support the functionality and sustainability of rural hill water systems



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WaterAid transforms lives by improving access to safe water, hygiene and sanitation in the world's poorest communities. We work with partners and influence decision-makers to maximise our impact.

Cover picture: Water supply system exists but lack of rehabilitation service delivery is not functioning, non functional water point from Kaskikot, Kaski District of

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Abbreviation

CBO	: Community Based Organizations
CBWSSP	: Community Based Water Supply and Sanitation
CC, BPT	: Collection chamber and Break Pressure Tank
DDC	: District Development Committee
DOLIDAR	: Department of Local Infrastructural Development and Agricultural Roads
DTO	: District Technical Office
DWSS	: Department of Water Supply and Sewerage
FEDWASUN	: Federation of Water Supply and Sanitation Users Nepal
FINNIDA	: Finnish International Development Agency
GoN	: Government of Nepal
GWS	: Gurkha Welfare Society
HDI	: Human Development Index
HH	: Household
INGO	: International Non-Governmental Organization
LTSS	: Long Term Sustainability Study
MCTG	: Mother Care Taker Group
MDG	: Millennium Development Goals
MLD	: Ministry of Local Development
MPPW	: Ministry of Physical Planning and Works

MTR	: Mid Term Review
NEWAH	: Nepal Water for Health
NGO	: Non-Governmental Organization
NPC	: National Planning Commission
O&M	: Operation and Maintenance
RVWRMP	: Rural Village Water Resources Management Project
RWSSFDB	: Rural Water Supply and Sanitation Fund Development Board
SO	: Support Organization
SWAP	: Sector Wide Approach
TOR	: Terms of Reference
VDC	: Village Development Committee
VMW	: Village Maintenance Worker
WASH	: Water, Sanitation and Hygiene
WSSDO	: Water Supply and Sanitation Divisional Office
WSSSDO	: Water Supply and Sanitation Sub-Divisional Office
WTSS	: Women Technical Support Services
WUSC	: Water Supply and Sanitation Users Committee

1 Introduction

1.1 Background of the research

The Government of Nepal (GoN) and other agencies invest significant funds every year in the establishment of drinking water systems in rural hill communities of Nepal. The basic water supply coverage has thus increased from 37% to 76% over 17 years from 1990 to 2007¹. However, many of these systems do not last their design period and therefore fail to provide sustainable water services to the communities they were established for. The 10th five year plan (2002-2007) states that most of the drinking water systems built in the past have become either totally or partially defunct. Profiles of 22 hill districts show that about 76% of schemes built in the past need major repairs or rehabilitation. This is as a result of many factors, including poor quality construction, natural disasters and a lack of proper operation and maintenance (O&M)

systems. Over the years, many rural hill communities have been provided support to construct water supply systems, as well as further support to replace and rehabilitate systems when they are no longer functional. There are other communities that have never been provided any support to access safe water during that time, showing an obvious lack of equity in the allocation of resources across the sector. This is evident from the fact that there are 42 districts below the national coverage of basic water supply.

From this perspective, this research is designed to explore the real situation and suggest ways that would significantly contribute to reforming the larger policy regime of the state concerning the institutional and sustainability factors that contribute to improving the functionality of drinking water systems in rural hill communities. This study also

¹ There Years' Interim Plan, NPC, 2007

attempts to suggest for the rationale of allocation of available resources for drinking water that could be used for incremental development in the sector towards meeting the water needs of the people more equitably in the country.

1.2 Objective of the research

The objective of the study is to review the equity of distribution of the investment and sustainability of rural hill water supply systems from two inter-related perspectives:

- the level of investment focused in constructing new and replacement systems and the rehabilitation of non-functional systems, and how and where it is prioritised
- the main causes of systems becoming dysfunctional and whether current institutional arrangements at the community, VDC and District levels address these issues adequately.

1.3. Limitation of the study

The Department of Water Supply and Sewerage (DWSS) has recently accomplished a nationwide data collection on water supply coverage, types of schemes, functioning status, O&M status, etc. However the report is not yet published. This study had largely expected to collect and analyse the data collected by DWSS. Due to absence of these data, the research is limited to its

study in very limited samples and other secondary data.

1.4. Definition of water supply systems

The following definitions have been adopted in this research:

- **New system:** refers to a water supply schemes constructed in a community that never had a safe water supply system before.
- **Rehabilitation:** refers to a water supply system that is dysfunctional, despite being within its design life (normally 15 years) and required either rehabilitating or replacing. In addition, the level of work required to make it functional should be beyond the amount that could be collected through an effective community O&M fund or beyond the technical capacity of the community and therefore require external assistance.
- **Replacement:** refers to a new water scheme that is being constructed in a community to replace (partially or fully) an existing dysfunctional scheme, which has crossed its design life.
- **Maintenance:** refers to the work that is conducted on a water supply scheme, in which part of or all of the system is not functioning, but the level of work needed to make it functional is within the financial and technical capacity of the community.

2 Methodology and approach

2.1 Desk study

Documents related to national plan, policy and strategies on the water sector in general and specifically on rehabilitation and sustainability issues were reviewed. Studies and reports on financial investment on drinking water projects and institutional arrangements were also consulted. The existing data, studies and research in the area of investment in new, replacement and rehabilitated water systems was also reviewed.

2.2 Consultation with stakeholders

A central level consultation was made especially to seek information on overall sectoral policy, project prioritization and selection procedures, level of investment, sustainability aspects, etc. Most specifically the following agencies were consulted:

- Department of Water Supply and Sewerage (DWSS) undertaking Community Based Water Supply and Sanitation Project (CBWSSP)
- Nepal Water for Health (NEWAH)
- CARE Nepal
- Rural Village Water Resource Management Project (RVWRMP) supported by FINNIDA and Nepal Government
- Rural Water Supply and Sanitation Fund Development Board (the Fund Board)

2.3 Selection of the study districts

Three hill districts were selected for the field study. The districts were selected on the following criteria:

- Water coverage more than 50 %
- Involvement of multiple agencies in water sector
- Strong presence of Federation of Water Supply and Sanitation

- (FEDWASAN) in the district
- Relatively accessible district to ensure completion of the study in a short time
- Representation of diverse development region

Based on the above criteria, Sankhuwa Sabha, Dhading and Baglung were proposed for the sample districts. Sankhuwa Sabha district represents Eastern Development Region, whereas, Dhading district represents Central Development Region. Dhading has strong presence of FEDWASUN. Baglung represents the Western Development Region. While the consultant team was in Kaski for other mission, a scheme in Kaski was also visited for this study.

2.4. Interview with stakeholders at the district level

Interview with stakeholders at district level will be carried out for an in-depth assessment of the drinking water projects currently being implemented by all the government and non-government agencies, local bodies, and other CBOs like the forest user groups in the district. The following agencies will be consulted

at the district level:

1. District Development Committee (DDC)
2. Water Supply and Sanitation Divisional Office (WSSDO) and Water Supply and Sanitation Sub-Divisional Office (WSSSDO)
3. District Technical Office (DTO)
4. Federation of Water Supply and Sanitation Users in Nepal (FEDAWSAN)
5. Pertinent projects, NGOs and INGOs working in the district

2.5 Study at the VDC/Community level

A total of 19 WASH projects were selected from the four sample districts for in-depth investigation. Various water supply and sanitation projects – recently completed, rehabilitated, replaced and defunct were identified at the district level consultation and consequently the sites were visited. While visiting the projects, the water users committees, VDC personnel, NGO personnel, selected beneficiaries, women groups, and other active groups in the project areas were interacted. Besides, observation of the schemes was also made. Of the total 19 schemes visited, 10 were rehabilitation, 8 new and 1 replaced scheme.

3 Analysis and findings

This research has analysed three main areas related to functionality and sustainability of gravity flow water systems in hill district of Nepal. The first area of analysis is focussed on the investment that the sector makes in the water schemes, and trying to identify any trend between investment in new, rehabilitation and replacement schemes. Taking this theme forward the second area of analysis has attempted to look at the selection criteria for water projects, and try to understand how communities and VDC are prioritised. Looking at the selection criteria of different agencies is expected to enable the impact of these criteria on the equity of allocation of resources and possible impact on long term sustainability. The final area of analysis has also looked at some of the main reasons for the poor levels of sustainability within the sector, and links these with policy and institutional mechanisms, which have been mentioned in the first two sections.

3.1 Sector policies on investment

3.1.1 Policy statements on roles and investments of sector agencies and their implementation and compliance

The Rural Water Supply and Sanitation National Policy, Strategy and Sectoral Strategic Action Plan - 2004 allows users to choose from various available RWASH technologies and clearly defines the roles of different stakeholders in the planning, implementation, operation and maintenance of RWASH schemes. Followings set outs the key roles pertinent to financing and sustainability aspect of WASH and how different actors are interpreting them in their programme and projects:

a. Financing related

National Policy states that WSUCs should contribute a minimum of 20% to the investment cost in water supply hardware, and this should include at least 1% cash. From a review of other

policies and practices in the sector only the government supported projects were found to have followed this policy exactly. Other major projects have sought additional investment from the communities themselves. In the case of the Fund Board schemes, the community are expected to contribute 30% of the investment in hardware costs, with 27% of this being provided in kind contribution and 3% in cash contribution. In NEWAH supported schemes community cash contribution is not required however kind contribution is up to 23%. The Finnish Government supported project seeks funding for investment from VDCs and DDC irrespective of the national policy. The DDC should allocate a minimum of 10% of its internal revenue per annum on water supply schemes in the district. The VDC should contribute a minimum of 5% of the hardware cost.

b. Institutional related

The Ministry of Physical Planning and Works (MPPW) and the Ministry of Local Development (MLD) are the two government agencies which oversee and implement the vast majority of government supported water supply and sanitation projects. MPPW implement water supply and sanitation project through its Water Supply and Sanitation Divisional/Sub-Divisional Offices (WSSDO/WSSSDO) and MLD through its District Technical Offices (DTO). It should also be noted that separate bodies have been established to implement the World Bank (Fund Development Board) and ADB (Community Based Water Supply and Sanitation Project and Small Towns Water Supply and Sanitation Project) supported projects in the sector.

There is a division of responsibility between MPPW and MLD in terms of water supply and sanitation projects, which states that MPPW will implement WASH projects with a population of over 1,000 and MLD with a population of less than 1,000. Although MLD and MPPW act together in close co-ordination to avoid duplication in the functions of DTOs and WSSDO/WSSSDO, the definition of what constitute a scheme with more or less than 1,000 households is loose and left to interpretation. This can mean that the two District level agencies can demarcate areas in which they wish to work to suit their respective size restrictions. It should also be noted that such restrictions on scale are not set out for other sector actors and therefore other actors can implement projects without any population size as a project boundary.

The GoN current policy clearly states the local government bodies will not directly implement WASH projects themselves but instead play the role of regulating, monitoring and facilitating the implementation of the projects on the ground. It goes on to state that communities and WSUCs should take the lead role in construction and implementation of WASH project works, including the procurement of external technical and managerial support and rural water supply and sanitation facilities made available from concerned aid agencies;

A lack of clear understanding of what a facilitating role for the DTOs and

WSSDOs actually involves, as well as some apprehension over the impact of handing over the function of implementer would mean, has resulted in this policy not being implemented consistently or effectively at the District level. Having said this there has been some attempts in recent year to more actively engage the VDC in monitoring, regulating and facilitating WASH project. This has been led by the Finnish Government support projects, and taken up by Helvetas, WaterAid and NEWAH, but still the engagement of the VDC is not inline with the how the currently government policy envisages it. There is no doubt that the lack of elected local officials and the deterioration of governance at the local level has contributed to these agencies not taking on the role as envisaged in government policy.

c. Project selection

A detailed decentralised planning process for local level development activities, including WASH projects, has been put in place at the District level. However the process is arguably too complicated with a significant number of steps and too ambitious in the current context with the lack of local level governance, mentioned above, resulting in this process not being following as designed, if at all. In relation to WASH activities, projects are supposed to be selected on the basis of projects prepared by the local bodies, which in turn is based on the VDC and community need assessments and demand.

Due to a lack of a functional local level planning systems and some agencies' desire to select their own project locations, in effective opting out of the systems, few agencies have the

criteria of selecting the projects that are identified by VDC and DDC assemblies. Many agencies simply inform the DDC of project that they have selected for inclusion in the District Development Plan. The absence of effective local government project selection criteria and agencies choosing to work outside of the system, has led to duplication of work and the inequitable allocation of resources.

d. Sustainability related

The GoN policy states that consumers themselves will own, operate and have responsibility to maintain water supply projects. Provision is also made for an O&M fund to be created, with upfront contributions from community members and small scale O&M costs should be fully borne by the community. Every agency has followed the policy of shouldering the responsibilities of O&M of WASH projects to the users with a formation and registration of water and sanitation users committees. The upfront cash as envisaged in the policy is mandatory for all the schemes irrespective of implementing agency, but the size of it varies from one agency to another. The upfront cash varies from NRs 1,000 to 1,500 per tap stands, but in case of the Fund Board supported schemes it is 3% of the construction cost.

In addition to community based O&M, the GoN policy states that local body and the government will provide some financial assistance for repair in case of huge and important structures. This is to be financed through a rehabilitation fund, which should be created at DDC and VDC level to support large scale rehabilitation financing. But none of

the visited schemes were found to have been supported from DDC and VDC. It was also not found such rehabilitation fund existed in the visited districts. Prior to this policy, the “Rehabilitation Policy, 2003” stated that rehabilitation was the responsibility of the implementing organisations. The policy also envisages that linkages will be established with income generating projects and activities by the implementing agency to strengthen the O&M fund at the community level. The policy also mandates the VDC to take a role in supporting WSUCs to register themselves and their water sources under District Water Resources Committees.

3.1.2 Investment trend on water and sanitation sector

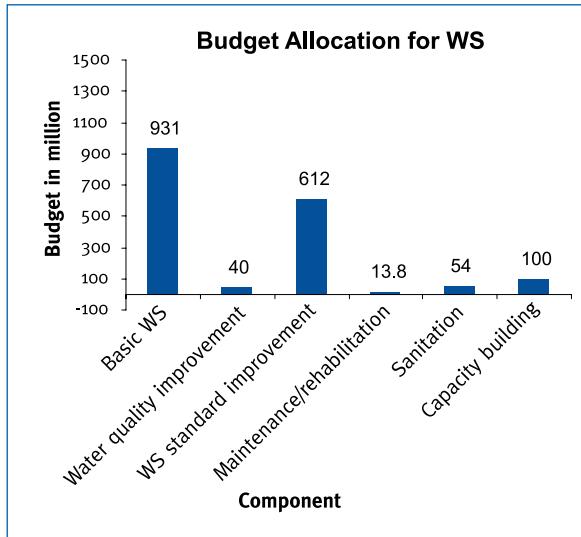
The Government of Nepal is found to have allocated budget for water supply and sanitation in periodic planning process since its fifth five year plan. Levels and patterns of funding of governments’ development expenditure on drinking

water and sanitation sector since the fifth plan is presented in table below. The level of funding in this sector has increased gradually from about Rs 268 million during the fifth plan period to about Rs 6,570 million during the eighth plan which is equivalent to an average annual growth of almost 200% over the period of 12 years. While significant increase in the funding level is apparent in the sector, differences are also observed in the funding pattern. In the fifth plan, about 45 percent of sectoral development expenditure were funded through foreign aid. This proportion declined gradually to a lowest of 43 percent in the no plan period (1991 and 1992) owing to poor funding capacity of the government.

At the local level, a survey of 15 VDCs showed that in FY 2005/6, 2.6% of their own resources and 4.9% of government grant was spent on drinking water facilities in an average. Similarly, 4.2% of VDCs’ own resources and 7.9% of government grant was spent on

Level and composition of development expenditure in the drinking water and sanitation sector

Plan period and year	Total WASH sector development expenditure (NRs. million)	Composition of development expenditure (%)	
		Government	Foreign aid
Fifth Plan (1977-82)	268.1	54.90	45.10
Sixth Plan (1980-85)	873.3	62.05	37.95
Seventh Plan (1985-90)	1881.7	60.30	39.70
No Plan (1991-92)	1878.9	56.63	43.37
Eighth Plan (1992-97)	6569.8	52.64	47.36
Ninth Plan (1997-2002)			
Tenth Plan (2002-2007)	58101.2		
Three Year Interim Plan (2007-2010)			



improving sanitation facilities. In the case of DDCs' expenditure on WASH sector in FY 2005/6, a survey among 5 DDCs revealed that 3.7% of both own resources and government grant was spent on drinking water sector. A survey among three municipalities shows that nothing was spent on drinking water sector in FY 2005/6 (NPC/UNICEF 2006). However the investment by types of WASH schemes is not available.

The review of the Red Book of the government during the tenth five year plan (2002 to 2007) shows that expenditure on rural WASH is below 1% of the total annual budget of the country. The figure below shows that among the total rural WASH expenditure, about 931 million Rupees (88%) are expended on the construction of the WASH system, whereas, 13.8 million Rupees (2.2%) on the maintenance of the constructed systems and 40 million rupees (8%) on water quality improvement.

3.1.3 Project cost

The project cost of WASH scheme widely varies from 0.9 to 2.3 million rupees among the various agencies during the period of 2005 to 2008. Many factors impact the cost of projects from the cost and transportation of materials, communities' location and size, the availability of water sources and many others. However disaggregated data of the investment by different agencies into new, rehabilitation or replacement is not available. WASH project cost of the Fund Board varies from 0.9 to 2.3 million rupees. In terms of funding pattern, about 72 percent of the average scheme cost are borne by the government through World Bank loan, about 2 percent in cash and about 27 percent in kind is borne by the community.

In the case of RVWRMP schemes, FINNIDA's contribution including the government averaged at about 74 percent while that of VDC accounted for about 2 percent. About 0.3 and 24 percent of the average scheme cost was borne by the community respectively in cash and kind. In a similar manner, around 77 percent of scheme cost were borne by NEWAH and the remaining 23 percent by the community in kind. CARE Nepal in its emergency water supply and sanitation projects contributes 82% whereas community has to contribute remaining 18% in terms of kind.

All these analysis shows that in the recent years, donors' contribution in RWS

Funding pattern of average scheme cost under different RWASH organisations

RWASH Organizations	Average Scheme Cost (NRS)	Share of Cost in Percentage			
		Donor	VDC	Community	
				Cash	Kind
RWSSFDB ³ (Batch VI) -2005/6	900,000- 2,300,000	71.6%	0.00%	1.71%	26.71%
FINNIDA (RVWRMP)-40 completed schemes in 2007/08	2,171,492	73.75%	2%	0.25%	24%
CARE Nepal (2008)	550,000	82%	Not required	Not required	18%
NEWAH (2006/7) ⁴	2,384,821	77.1%	Not required	Not required	22.9%

in Nepal is around 70 to 80% whereas community contribution is around 20 to 30% in terms of cash and kind. The community's cash contribution is around 0.3 to 2%. However CARE Nepal and NEWAH waves off the communities' cash contribution in the projects. Only the Fund Board seeks cash investment from the local government bodies. Many agencies lack coordination with the VDCs and DDC for co-funding although FINNIDA supported projects have mobilized VDC and DDC fund.

The above costs include only construction cost of the WASH schemes.

3.1.4 Investment patterns in new, rehabilitation and replacement systems
 Among the 19 WASH schemes in the three districts (excluding Kaski), average investment for the new project is Rs 13 million rupees and Rs 13.8 for

rehabilitation projects. Interestingly the project cost of the rehabilitation is slightly larger than that of the new schemes. The rehabilitation projects selected for study were the large projects undertaken by the government; hence the rehabilitation project cost is apparently larger. The average community contribution is around 26% in terms of cash and kind, with about 74% of the total cost being contributed by the funding agencies. The community contribution in rehabilitation schemes is about 32%, only marginally more than with new schemes. In RVWRMP schemes the community have to invest from 25% to 50% of the total rehabilitant projects whereas they have to pay only Rs 500 per tapstand for a new project.

Although it seems logical that communities contribute more toward rehabilitation of schemes than they

³ Annual Report 2006, published by RWSSFDB

⁴ Annual Report 2006/7 published by NEWAH

would for their first water scheme. If communities are able, and allowed, to continue to access “new” schemes at the same rate as their first scheme, rather than rehabilitating their exiting schemes, then the system is set up as a disincentive to rehabilitate existing scheme.

3.2. Scheme selection and planning procedures

3.2.1 Different sector agencies selection and prioritisation procedures

The selection and prioritisation procedures for selecting WaSH interventions of the following five organisations were critically reviewed. Many agencies claim that they are adopting a demand led approach to select the schemes but exact definition is not available. Demand led approach is indeed a broad term and difficult to define. However, in this study, the demand led approach is perceived in three aspects- involvement of local government bodies, support of NGOs and commitment of the communities in the schemes. The higher the commitment of communities with the involvement of the local government bodies can be considered as the most demand led approach, whereas the higher the involvement of NGOs with the low commitment of communities can be considered as the lowest demand led approach. However, if there is low level of commitment of communities in any case, the approach cannot be considered as the demand led approach.

In this context, the below table gives various procedures being practiced by different agencies.

The table in text page depicts that the Fund Board expects high level of involvement of NGOs with low level of local government bodies' participation and good level of community's participation in the scheme cycle. In contrary, the FINNIDA supported RVWRMP expects high level of local government bodies' involvement with low level of NGO participation and good level of community participation in the scheme cycle. The approach of the government is different than the previous two agencies. The government expects low level of participation from both the local government bodies and NGOs and even from communities. The government relies on the contractors and uses committees. NEWAH however pours its heavy input of its own staff with a low level of participation of local NGOs and local government bodies. CARE also relies heavily on its staff, and places less emphasis on the participation of local government bodies and local NGOs.

The analysis shows that the community led approach is still required to strengthen by all the agencies with fair balance of local government bodies and local NGOs. Most specifically local government bodies are relevant and important in the context of the support for major rehabilitation and operation and maintenance of the schemes after phase out of the schemes implemented with the support of external agencies.

Assessment of demand led approach taken by various organisations

Procedures	Fund Board	FINNIDA (RVWRMP)	DWSS	CARE	NEWAH
Involvement of local government bodies					
Schemes prioritized in the VDC/DDC level master plan	-	Yes	-	-	-
Schemes endorsed by VDC /DDC assemblies	Yes	Yes	Yes	-	Yes
Commitment required for funding from VDC/DDC	-	Yes	-	-	-
Involvement of NGOs					
Request letters through NGOs	Yes	-	-	-	-
NGOs involvement in planning, implementation and monitoring and evaluation	High	Medium	Low	Low	Medium
Level of community participation					
Request letter submitted by users	Yes	Yes	Yes	Yes	Yes
Users request with full commitment of contribution for upfront cash for O&M	Yes	Yes	Yes	Yes	Yes
Users request with full commitment of contribution for upfront cash for investment	Yes	Yes	-	-	-
Communities involvement in planning and monitoring and evaluation	Medium	Medium	Low	Low	Medium

a. Government procedures

The procedure varies from one project to another in case of DWSS. If it is donor supported project, it follows the guidelines developed for the specific project. Otherwise DWSS adopts the procedures differently for its regular

government funded projects based on the divisional and sub-divisional offices. The Community Based Water Supply and Sanitation Project supported by ADB follows the procedures set in the project guidelines. According to the guidelines, the VDCs are selected based

on the HDI and communities based on the existing water hardship, poverty ranking, low sanitation status, majority deprived people and remoteness. The schemes must be endorsed by VDC and DDC assemblies. However divisional and subdivision offices seek the schemes for its regular programme under the government funding from among the schemes passed in the DDC assembly and prioritized by the political parties. Dhikurpokhari-Kaskikot-Sarangkot scheme in Kaski, Balewa Narayanthan WASH schemes in Baglung and Dhadingbesi WASH schemes in Dhading are the examples which were selected with political motives.

b. NGOs and bilateral projects

FINNIDA seeks the schemes to be prioritized in the VDC level master plan and endorsed by VDC and DDC assemblies and also seek investment support from VDC as a mandatory. The Fund Board employs NGOs to assist the communities, whereas NEWAH collect community applications and is increasingly working with VDCs and DDC to endorse these. Involvement of NGOs is high in the Fund Board and FINNIDA supported schemes, whereas poverty focused criteria is strong with NEWAH supported schemes. CARE as it works specially for emergencies water supply, it does not follow all the participatory approaches rather complete the construction works in a short period with technical and financial supports from CARE itself although it also mobilise local NGOs for community mobilisation.

3.2.2 Project selection criteria

When comparing the prioritisation criteria used by different agencies, the following major criteria are, in general, found being used:

- **Size:** As already mentioned above government bodies have divided responsibility for schemes based on their relative population size. The DWSS undertakes schemes of over 1,000 people, whereas, DOLIDAR below 1,000 population. The Fund Board expects schemes of less than 900 population and other agencies normally below 1,000 population.
- **Demand based:** Following criticism of agencies implementing a supply led approach, over the last ten years there has been a shift to “demand led” or “community willingness” approaches. This has seen criteria added to selection criteria which relate to community request and engagement, which also include communities’ financial and in kind contribution. Some agencies have slightly modified the demand led approach, to a “demand stimulation approach” recognising that often it is the relatively wealthy or influential communities who find it easier to demand basic services. As a result poorer, excluded and more remote communities, who were un-aware of available support to improve water services, were not coming forward to request support.
- **Technical:** All the agencies include criteria which relates to the yield of available sources being sufficient to

support the target areas. For rural WASH schemes, the water should be sufficient to meet water demand at the rate of 45 lpcd and for urban and semi –urban WASH at the rate of 80 to 100 lpcd. All the agencies have the criteria of the source to be perennial for round the year.

- **Existing service level:** The Fund Board includes criteria which relates to the distance communities currently have to travel to fetch water. The fetching time should be above one hour on average. CARE includes criteria that targets communities where water quality is poor, which is measured through the prevalence of water borne diseases and epidemics. Fund board allows for private taps provided the user HHs pay 100% of the cost required for the additional investment.
- **Social poverty and social exclusion:** Social cohesion is used a criterion in many projects which is primarily measured through the lack of disputes over the water sources identified for the projects. The selection of communities based on relative poverty or due to a high number of socially excluded groups, such as Dalits, is also used by some agencies.
- **Local government's prioritisation:** FINNIDA (RVWRMP) has given much emphasis to the planning and contribution by the local government bodies such as DDC and VDC. The schemes are selected only if the

scheme is prioritised in the Water Users Management Plan (WUMP) of the VDC and consequently passed in the VDC assembly. Recently the Fund Board has also made mandatory provision of the schemes to be passed by the concerned VDC assembly. NEWAH are also moving to an approach that encourages the VDC to prioritise communities within their working areas. The government seeks the schemes passed by the DDC assembly.

- **Sustainability:** As mentioned above, in the most part this relates to communities agreement to establish and contribute to an O&M fund. The fund board has the criteria to raise 3% of the hardware cost for O&M. FINNIDA (RVWRMP) collects Rs 500 per tap whereas DWSS collects Rs 1000 per tap as upfront cash for O&M. However some agencies, such as NEWAH, have included criteria which stimulate agreements with the community to contribute time into the planning, implementation and long term management of the project. All the agencies also encourage continuing to raise the fund after the construction of the schemes.
- **Cost per capita:** Cost per capita is also a criterion that some agencies use to select and prioritise project selection; however from a review of the policies there is a little consistency between agencies and within the sector. Different agencies have set criteria of different per

capita investment cost for projects to be feasible and it should be noted that these cost are often based on just the project implementation cost and not inclusive of wider organisation costs.

- Schemes to be funded under the Fund Board programme, for example, should have per capita cost at design stage in between Rs 2,400 and 3,000. The Fund Board seems to have implemented this policy in a consistent manner, as the average project cost per capita of schemes of Batch V was NRs 2,756 and in Batch VI was NRs 3,052.
- NEWAH don't have such a rigid policy as the Fund Board but have guidelines that expect capita cost to be in the region of NRs 2,500 to 3,000 per capita cost of the project, and the Finnish Government supported programme has not set ceiling for per capita cost.
- What can be concluded is that cost per capita schemes vary significantly between and within agencies based on locations and approaches adapted. Evidence supports the belief that the more remote the locations are the higher the cost per capita, with project per capita cost in the remote VDCs almost double of average per capita cost across the country and agencies. RVWRMP have more schemes than other agencies in remote VDCs of mid and far western development region, have the highest cost per capita at

NRs 5,575. As would be expected analysis also shows NEWAH and Fund Board cost increase in remote locations.

- The impact of cost per capita restriction on project selection could result in some remote and/or difficult to serve communities continuously not getting prioritized by agencies, thus leading to their continued exclusion from the provision of services. Although little evidence has been able to be gathered to prove this point, this research also believes that the cost of rehabilitating existing partially functional schemes would have a lower cost per capita versus new systems. Therefore cost per capita criteria was applied in those communities where investment has been made in the past might be prioritized above those where no investment has been made.

3.2.3 Criteria not currently considered

The above criteria were reviewed and also cross checked in the selected schemes in the field. Most of the criteria were found to have been used while selecting and prioritising the schemes. The following criteria, however, were not considered or used by any agencies:

Eligibility criteria

- There are no separate criteria for assessing the interventions, whether they be a new, rehabilitation or replacement system, which had been implemented in previous years in the VDC or District.

- Agencies don't have criteria or policy on the proportion of new, rehabilitation or replacement system to be implemented in specified years/phase, District or VDC.

Technical criteria

- The design life of existing water systems was not considered to assess whether it was more appropriate to implement a rehabilitation or replacement project.
- The service level of the existing systems is not thorough analysis again to identify if an rehabilitation or replacement scheme is more appropriate.
- Quality of water at the source.
- Period for construction is never considered. Most of government projects were found requiring more than 10 years of construction period but the design period of the scheme was not considered accordingly.
- Minimum coverage of the scheme is not considered whether VDC level or ward level. Some schemes have the coverage of only a cluster of a ward or few wards of a VDC. If all the clusters are not covered in a ward or VDC, it takes another huge logistical support for next time for other agencies. Moreover, it is unlikely that other agencies intervene in that uncompleted ward or VDC because the other agencies always seek the previous untouched ward or VDCs.

Social criteria

- Institutional aspects of the existing systems, e.g. is a User Committee in existence and what are the barriers

which stop it functioning.

- HDI is one of the criteria for selecting the districts but it has not been applied to select the VDCs.
- Gender and social inclusion issues are lacking in the selection criteria.

Economical criteria

- The investment criteria for new, rehabilitation and replacement systems, e.g. different per capita.
- No criteria for community contribution based on previous scheme and nature of intervention (new, rehabilitation or replacement) willingness to pay for the services.

Sustainability

- Follow up mechanism of the WSUCs.
- Willingness and commitment of community to contribute a regular tariff for O&M activities.
- Identification of maintenance workers to support O&M work.
- Linkage and coordination mechanism with the concerned District agencies.

3.2.4 Consequences of poor selection criteria of projects

The absence of the above selection criteria has caused a number of consequences, which are set out below:

a. Unbalanced allocation of resources

The lack of proper selection criteria and guidelines has caused a serious misbalance in allocation of resources for water intervention in the district and VDCs. In Baglung, out of 26 VDCs studied, 7 VDCs have only one WASH project in each VDC during the last five years, whereas 5 VDCs have over five

WASH schemes in each VDC during the same period. In Damek VDC there have been 11 schemes constructed during the last five years. Interestingly NEWAH supported to seven schemes and the Fund Board to four schemes in Damek VDC. The budget for the last five years in a VDC ranges from 1.5 million to 40 million rupees. In an average the budget allocation in a VDC is 7.2 million rupees in five years and 1.4 million rupees in a year. There are other several VDCs in the district and other districts having water supply coverage less than the national average but without the adequate budget for WASH. This is truly the consequence of lack of proper criteria of scheme section.

Similar to Baglung, a study of VDCs in Dhading reveals that the investment in a VDC over the last years was incurred from 0.2 to almost 12 million rupees. However the average investment in a VDC in the last five years is about 0.7 million which is almost ten times less than investment in Baglung. It shows that the investment pattern is not uniform, but rather is based on existence of donors and active NGOs irrespective of the water coverage required in the district.

b. Duplication

In Dhading, various VDCs were found to have duplication of schemes by different agencies. In Murali Bhanjyang VDC, it was observed that various agencies had been involved in the provision of water schemes between 1985 and 2007; these included the VDC, UNICEF, WSSDO, and RWSSFDB. However despite a number

of communities being provided more than one scheme during that time, interestingly in two wards (Wards No 2 and 5) no scheme have been provided at all, and these communities were suffering significant water shortage. These wards are inhabited by the Kumal ethnic community.

In Baryang Bazaar, Ward No. 3, of Hugdiseer VDC in Baglung district, WSSDO, GWS and RWSSFDB are all implementing water schemes. Initially WSSDO implemented a WASH scheme in this ward during the period of 2000 to 2006. Later in 2007, GWS and the Fund Board intervened in this Ward to cover some of the communities and households that had been left out by previous interventions. If the WSSDO had covered all the communities in this Ward, the overhead and other logistic expenses which overheads expended by GWS and the Fund Board could have been minimised. The project selection criteria of WSSDO did not delineate the size of the community, if would have been more efficient to cover a whole areas, such as a VDC, to minimise the logistic and other administrative cost.

Due to the lack of elected Local Government in recent years and the fact that some agencies do not have mandatory provision to coordinate with Local Government, many agencies have not put their planned intervention VDC and DDC assemblies for approval. In the absence of these criteria, the duplication, as well as poor targeting, will continue to exist in future too.

c. Repetition

Many water schemes do not remain functional for their full design life. The design life of a WASH scheme is typically 15 to 20 years. The reason of low life might be different from one scheme to another. Some may be due to technical design and implementation weaknesses, some may be due to water depletion, some due to natural calamities and some due to poor operation and maintenance. Whatever the reasons might be, many schemes are found to have revived with a new project.

Balewa Narayanstan scheme in Baglung district was constructed for the first time by the DDC in 1977. Only two years later, when it was dysfunctional it was again rebuilt by Indian Embassy in 1979. This scheme lasted for five years before it was reconstructed by DWSS in 1984. Now after 22 years, a major rehabilitation has been initiated by DWSS in 2006 and it is still ongoing. The rehabilitation includes the construction of a new reservoir tank but not the other structures. It is likely that the scheme needs other rehabilitation schemes in near future. The rehabilitation project was approved after a delegation of people visited the then Finance Minister and it was given approval irrespective of project selection criteria for choosing a scheme for rehabilitation.

d. Poorest communities excluded

The Federation of Water Supply and Sanitation Users Nepal (FEDWAUN)

is coordinating with various Citizens' Action Programme in Dhading district. It has studied 31 schemes in the year 2006. Out of 31 schemes, users of 15 schemes have been left out due to obligatory provision of cash and labour contribution as they could not afford.

e. Prolonged project period

The criteria do not specify how many years the schemes take to complete the construction. Due to this, many government undertaken projects take over 10-15 years to complete a project. The design period is hence almost over by the end of the construction of the project. In Kaski, Dhikurpokhari-Kaskikot-Sarangkot a water scheme was initiated in 2001 and the progress till 2009 is only about 15% of the total budget and time. It is expected that it will take the next 7 to 8 years to complete the 100% construction. By that time the design period will also be almost over. In Dhading, it took 10 years from 1981 to 1991 to complete the construction work of Dhadingbesi WASH Scheme. There are other several evidences of such long term projects in Nepal, and they have many long term implications. The structures which are built at the beginning needs rehabilitation by the time of completion of the schemes, the market rate fluctuates and the quality of works are compromised to compensate the increased rate of construction materials. Moreover the technical personnel assigned for the schemes construction change such long time periods and hence supervising works are greatly affected.

3.3 Functionality and sustainability of water supply systems

To date there is no central sector monitoring system to review the functionality and sustainability of water supply interventions by different agencies. In recent years there has been increased recognition for the need for such a government led systems, and in recent months an attempt has been made to develop some sector wider indicators to guide the establishment of a sector monitoring system. In its absences agencies have been left to review the functionality and sustainability of their intervention in their own way, but with no obligation to conduct such monitoring or share the result. Despite this some agencies have made good progress in reviewing the sustainability of their interventions, which has led to significant learning for the whole sector.

NEWAH with financial supports from WaterAid implemented 228 hill WASH projects between 1992 and 1998 in all five development regions. A looking back study was conducted from 2001 to 2005 of those hill projects. The objective of the study was to assess the sustainability of the projects and identify weak projects in need of supports, as well as to modify and develop new approaches to improve the chances of sustainability for future projects.

Rural Water Supply and Sanitation Fund Development Board (RWSSFDB) implemented 585 WASH schemes (both hill and tarai) in three batches - batches I

(completed in 1999), batch II (completed in 2001) and batch III (completed in 2004) in all five development regions. A separate Long Term Sustainability Study was conducted for each batch in 2007, 2007 and 2008 respectively to assess the long term sustainability of the completed projects. In the same way, the Rural Village Water Resources Management Project (RVWRMP), with support from the Finnish Government, commenced from October 2006 for a period of four years up to October 2010. A midterm review was conducted in 2009.

This research study has reviewed the Long Term Sustainability Studies (LTSS) of NEWAH, Fund Board and the midterm report of FINNIDA/ RVWMP. From these this research has extracted lessons learnt from these studies.

3.3.1 Sustainability indicators

Different agencies have assumed different sustainability indicators of the WASH Projects. However, the major parameters adopted are broadly consistent; technical, institutional, social, environmental and financial. NEWAH and Fund Board have almost the same parameters but FINNIDA has a different set of criteria. FINNIDA largely rely on the comprehensive Water Use Master Plan at the VDC and DDC level, rather than a particular scheme. It also considers the human resource capacity of the users.

The sustainability criteria however do not differentiate for new, rehabilitation and replacement projects. The criteria also do

Indicators of sustainability

Parameters	NEWAH	Fund Board	FINNIDA
Technical	<ul style="list-style-type: none"> • Source yield • Functioning of water points • Functioning of structures 	<ul style="list-style-type: none"> • Source yield • Functioning of • Functioning of taps 	<ul style="list-style-type: none"> • Sustainable water use • Resource use structures
Social	<ul style="list-style-type: none"> • Health and hygiene impact 	<ul style="list-style-type: none"> • Community participation 	<ul style="list-style-type: none"> • Planning capacity of users • Implementation capacity of users • People's participation
Institutional	<ul style="list-style-type: none"> • Status of users committee • Involvement of users committee in other development • Status of care takers 	<ul style="list-style-type: none"> • Users committee status • VMW status • MCTG status • WTSS status • Coordination and linkage 	
Environmental	<ul style="list-style-type: none"> • Hygiene and sanitation 	<ul style="list-style-type: none"> • Hygiene and sanitation 	
Financial	<ul style="list-style-type: none"> • O&M fund status • Regular O&M 	<ul style="list-style-type: none"> • Environment • O&M fund collection 	

not explicitly specify the sustainability against the age of the projects after construction completion.

3.3.2 Approaches to address Operation and Maintenance of the systems

Each of the WASH organizations reviewed was found to be strict in collecting a community O&M fund before the project interventions commenced, to ensure community ownership and support with schemes sustainability through proper management in future. The upfront cash for O&M fund is generally based on the number of tapstands. The range of

upfront cash to be collected is from NRs 1,000 to NRs 1,500 per tapstand. Only FINNIDA was found to have separate provision of upfront cash with reference to new and rehabilitation WASH schemes. The upfront cash for new scheme is NRs 1,500, whereas for rehabilitation scheme is NRs 500 per tapstand. The Fund Board in contrary enforces the community to raise 3% of the construction cost as the upfront O&M fund.

The WASH organizations were also found to have encouraged the communities to collect O&M fund on a regular

Criteria for O&M fund collection

RWASH agencies	O&M supports by	Upfront O & M Fund the agencies	Regular O&M fund (by users)	Provision of VMW
Fund Board	No	3% (for Hills) of the construction cost raised during the development phase	WSUC decides to collect in monthly basis in terms of cash and or kind	VMW/VHP
FINNIDA	Livelihood and multi-purpose water use to increase capability of users to raise O&M fund	Rs.1500 per tapstand by users (for new scheme) Rs 500 per tapstand for rehabilitation scheme	Users are encouraged to raise fund (cash and or grains) in the monthly basis.	VMW
DWSS	No	Rs. 1000 (Min.) per tapstand		
CARE Nepal	No	Project don't have practice of collecting fund upfront cash for operation and management	Due to failure of project to collect funds, other options are being explored including through VDC.	
NEWAH	No	Rs. 1,000 per tapstand	Users are encouraged to raise fund (cash and or grains) in the monthly basis	VMW

basis, generally on monthly, from each household. The water tariff is expected to cover the minor repair and maintenance and also the incentives of the VMW assigned for the schemes. The water tariff is however paid by the community in terms of cash and/or grains. The water tariff is generally ranges from NRs 5 to NRs 100 in a month.

The study shows that every agency seek full commitment from the users to collect up front cash for O&M, however only the Fund Board and FINNIDA seek both the cash investment and up front cash for O&M fund. All the organizations were also found to have ensured the provision of Village Maintenance Worker (VMW) for the daily operation and maintenance

of the schemes. The VMWs are trained to impart their knowledge and skill to effectively operate and maintain the schemes. The VMWs are generally trained during the project implementation phase or even prior to this so that they could take part during the construction activities. When they take part in the construction, their knowledge and skill are expected to enhance on various components of the schemes as well.

3.3.3 Actual O&M systems in the fields
Operation and maintenance systems were found to have been established only in about 53% of projects visited. An average Rs. 66,300 was found to have been established in the 10 schemes out of 19 schemes visited. The fund was generally raised in those schemes during the construction or before the construction as the upfront cash for O&M. The upfront cash was raised as the respective agencies had mandatory provision to raise the fund. There was no O&M fund for the remaining 9 schemes as the agency did not impose to collect the upfront cash during the project. Of 19 schemes visited, only in 4 schemes, the people were found to have been regularly raising monthly fees for the salary of Village Maintenance Worker (VMW). The monthly rate is Rs 10 per month. Average salary for the VMW is NRs. 1,538 per month. Among the four, three schemes where upfront O&M fund was established and regular monthly fees is also being collected are functioning well and one scheme functioning partially. Although it appeared that schemes where O&M funds are not established and monthly fees not

collected were mostly defunct. There were also a high number of schemes with O&M funds in place that also were defunct. The correlation between O&M and funds resulting in functioning system was not so strong, showing that other institutional and technical factors also have an impact on functionality.

Some of the projects are functioning well where users are active and have a strong feeling of ownership. For example the Simle DWSS scheme was completed about 15 years ago and till to date also it is running very well. It has proper Operation and Maintenance system. A VMW who was trained during the construction period is still working and is regularly paid from the monthly tariff collected from each household.

3.3.4 Status of sustainability of water supply systems

Over the past 30 years, although the number of water schemes constructed has increased significantly, the majority of water schemes have not functioned effectively for their designed period. Resources had to be allocated repeatedly for repair, rehabilitation, replacement and duplication of the schemes, which were implemented by both the government and non-government sectors. Coordination and monitoring mechanism between stakeholders remained ineffective. The lack of integrated efforts in planning, implementation and monitoring continues to be major challenges for sustainability of water schemes.

Aspects of Indicators for sustainability	NEWAH (after 3-6 years of completion)	Batch I (after 7 years of completion)	RWSSFDB Batch II (after 5 years of completion)	Batch III (after 4 years of completion)
1. Institutional				
Sustainable	47%	0.0%	4.4%	8.7%
Fair/Good	11%	70.0%	40%	64.1%
Defunct	37%	30.0%	55.6%	27.2%
2. Social and environment				
Sustainable	-	15.0%	17.8%	21.7%
Fair/Good	-	70.0%	66.7%	65.2%
Defunct	70%	15.0%	15.6%	13.0%
3. Financial				
Sustainable	60%	25.0%	15.6%	50.0%
Fair/Good	33%	35.0%	15.6%	22.8%
Defunct	7%	40.0%	68.9%	27.2%
4. Technical				
Sustainable	30%	50.0%	55.6%	10.9%
Fair/Good	50%	5.0%	37.8%	79.3%
Defunct	20%	15.0%	6.7%	9.8%
Overall sustainability				
Sustainable	30%	15%	18%	3%
Fair/good	50%	50%	60%	80%
Defunct	20%	35%	22%	16%

The 10th five year plan (2002-2007) states that most of the drinking water systems built in the past have become either totally or partially defunct. Sustainability of scheme is thus the major issue to achieve MDG goal by 2015. When reviewed the Long Term Sustainability Study (LTSS) of NEWAH and RWSSFDB following status of the sustainability of the WASH schemes were found.

The study reveals that only about 30% of the WASH schemes continued to function well after 3 to 6 years in case of NEWAH supported projects, whereas, 15 to 18% of batch I and II WASH schemes supported by Fund Board are well functioning after the 5 to 7 years of completion of the project. Interestingly, only 3% of the batch III WASH schemes are functioning well after 4 years of the completion. About 20% of

the scheme are defunct and need major rehabilitation after the completion of 3 to 6 years by NEWAH. The study also shows that nearly 60% of the system supported by NEWAH has broken down at least once after the completion. The case is worse with Fund Board supported projects. About 35% of batch I and 22% of batch II WASH schemes are defunct. Similarly about 16% of the batch III WASH schemes are defunct.

3.3.5 Major causes of dysfunctional of water systems

Of the total 19 gravity flow water schemes visited, only six were found to be functioning well, seven partially functioning, and three under construction. Interestingly two water schemes were found to have ceased its functioning and one is a virgin community no one has yet intervened. Among the six schemes which were

The table below shows summary of LTSS of NEWAH/WaterAid supported schemes:**

Parameters	Status	Description of the status
Water source	71% intakes having some sorts of problems Among them, 92% are stream sources	Reasons: <ul style="list-style-type: none"> • Leaks: 29% • Land slide: 9% • Flood: 9% • Run off water mixing: 8% • Source disputes: 3%
O&M system	74% of caretakers are the original trained ones. 26% of them are new without training 55% UCs having tool box	47% caretakers getting regularly monthly payment 11% caretakers getting regularly kind incentives 37% caretakers not being paid
O&M fund	Average size of fund: NRs 19,244. Ranging from NRs 290 to 230,720	62% of the projects has the fund deposited in the bank 50% of the project does not raise the fund regularly 36% of project use the fund for O&M 14% of project invest the fund for loan 30% of the project never use the fund
Breaking down	57% of project have broken down at least once after completion	18% of the projects were repaired in 1/2 days

** Long term sustainability study of batch I, II and III schemes, RWSSFDB, 2008

Krishna Bhir WASH (Dhading district)

It was constructed 16 years before with the support of WaterAid. It consisted of 25 tapstands for 130 families. However its pipe line was washed away by Krishna Bhir landslide some 10 years before. The people repeatedly contacted VDC and DDC for the supports. They were supported a few times with a small amount for the pipe line but it was repeatedly disrupted by the land slide. Then the people gave up the hopes of maintaining the schemes and went back to the initial practice of water fetching from traditional sources. The Krihna Bhir land slide is now under control since 5-7years, but none of the agencies have gone back to support them.

functioning well, the life of the schemes is within the period of 5 years after the construction. It is quite natural that the systems must be functioning well during such young age of the schemes. The age of schemes which are running partially ranges from 9 to 20 years. It seems that although they are within the design life, the functioning is reduced to partial only. In most of the partially functioning schemes, there is lack of O&M fund and provision of VMW.

The life of the WASH schemes which are defunct ranges from 8 to 16 years. Following are the reasons of schemes are defunct or partially defunct:

a. **Weak capacity and motivation of Water and Sanitation Users Committee (WSUC):** Performance of WSUCs is one of the key factors that determines the success and failure of a project. The role of WSUC has been influence by the policy and institutional mechanism established by the government within of the drinking water sector in Nepal. These polices place increased responsibility on communities, and WSUCs as there

representatives, to operate and manage their system without external support. As result the importance of building ownership and capacity of WSUC to enable them to engage actively in the water systems from planning and design, through implementation and monitoring to long term operations and maintenance is vital.

Examination of practices of various stakeholders' shows that more focus has been given to preconstruction and construction phases and very little attention has been given to post construction stage. But the experience shows that users are found more active in the earlier stages of the project, but gradually become passive in post construction stage. A study conducted by NEWAH shows that about 50% of WSUCs were found to be ineffective in holding meeting on regular basis, only 5% WUSC holding monthly meeting, and 40% WUSC held only one meeting till the survey. Such status of WSUC clearly shows the weak motivation of WSUC is one of the pertinent reasons behind the failure of project.

Due to the sector's broad adoption of a project based approach and the lack of appropriate institutional support mechanisms, assistance from external agencies decline drastically once water system move from construction to the operation stage. The lack of local government led monitoring mechanisms has resulted in no effective mechanism to identify and prioritise support needs and investments, leaving communities with little capacity or motivation to address ongoing technical and institutional problems.

b. Inadequate and improper management of O&M fund:

The provision of a maintenance fund of an adequate size is another factor that helps keep water schemes operating smoothly. Its mobilization again depends upon the institutional capacity of the WSUC and the supervising agency at the district level. Having maintenance fund is not enough, it is also highly important to mobilize it for the betterment of the project. Often it is found that the only motivation for the WSUCs establishing

an O&M fund is to fulfill the external agencies requirements and securing external support. However in post construction stage with the declining frequency of monitoring from external funding agency the collection and mobilization of O&M funds is neglected, which causes ineffective operation and maintenance of the project.

Information from the field survey shows that about 90% of project users reported that, fund is insufficient to pay fees for O&M workers, and maintain the project. The LTSS of NEWAH showed that about 37% of the maintenance caretakers are not being paid for their services. The average size of fund NRs. 19,244, ranging from NRs 290 to NRs 230,720. Community people were found to be unaware of the maintenance funds in only 7% of projects, which indicate some lack of transparency. How much O&M fund should be within a community or local bodies to effectively operate the completed project by the communities, is a serious question for the stakeholders working in the drinking water sector.

Pashupati WASH Scheme (Dhading district)

It was constructed in 2000 with the support of the Fund Board. The following year, the pipe was burst up and the system was since then ceased. The total length of the HDP pipe is about 2000 m. The main reason of the bursting the pipe seems to be due to a design fault. Low pressure pipes were designed not meeting the pressure of the static head of the pipe line alignment. The community people hardly tried to replace the burst pipes. Even they do not have O&M fund. As the VMW was not paid by the community, he is also not contributing to the scheme.

c. Lack of regular service of trained Village Maintenance Worker

The present of a skilled VMW is essential for ensuring the day-to-day operation and maintenance of water systems. The absence of VMWs has been a significant cause of drinking water scheme not being functional. In many cases there are VMW but they have been poorly trained or not provided refresher training. In other cases where there are VMWs in place they are not motivated to do their jobs, which is often related to lack of or insufficient financial reward. To be able to pay VMW communities need to have both an active and motivated WSUC and also have sufficient funds in their O&M fund to pay a monthly salary.

According to the information of field studies, about 60% of projects found trained VMW paid by WSUC. However the users reported that they are unable to fully pay VMW from the O&M fund. In the LTSS of NEWAH found that 60% of completed hill schemes found caretakers out of them 74% were original caretakers, and 26% new caretakers. Total of 47% caretakers have a toolbox and rest 53% do not. In 47% of projects, it was found that caretakers are paid cash on a regular basis, and 11% in project in kind and rest 37% of project did not pay wage to caretakers. This all suggests that there is a lack of trained VMWs available to oversee everyday O&M in the communities. Issues have also been raised concerning their technical competency and ability to

undertake the responsibility with limited external support after only short training.

There is an argument that VMWs need to be managed in a more formal way by communities, to ensure they are motivated and accountable for conducting their responsibilities. Although it must be recognised that there are instances where in kind payments or payment on “pay-as-you-work” basis have worked, generally these informal agreements don’t result in an effective system to support long term sustainability. On a significant advantage of formalizing the VMWs, is that there is increased scope to create linkage between VMW within a VDC and DDC, and also with local government agencies, for technical support and backstopping.

d. Involvement of incompetent manpower

Poor initial survey and design, as well as poor construction, of gravity flow water schemes are mainly due to the involvement of incompetent manpower. With the involvement of increasing number of funding agencies planning and implementation of drinking water projects have been carried out through local NGOs. Local NGOs often don’t have the capacity to undertake the important design phases and overseeing of construction required to ensure the water schemes remain functional for their design life. Local NGOs find it hard to attract high skilled staff and rarely provide sufficient training to their technical

staff to fulfill the role expected of them. Often technical skills within supporting agencies are not based at the project site, and therefore are not able to monitor project work in a timely manner. This could be covered by increased linkages with local government agencies, but these relationships are rarely made or spare capacity effectively utilised.

e. Lack of institutionalised monitoring mechanism

In the absence of established monitoring mechanism at district and national level for the sector as a whole there seems to be a lack of accountability for the improper maintenance of drinking water systems. Local bodies have not taken up their responsibilities as set out in the decentralized act, due to a lack of clarity on roles and responsibilities. There is ambiguity among the MLD and MPPW to look after water sector in the district.

Various stakeholders apply their own operational modalities. As a whole there is a lack of sector wide approaches in planning and monitoring of the water sector. There is no information both at

district and national level that how much investment is required and is invested in new, rehabilitation or replacement schemes. The Government has yet to put fund aside or allocated budget at the district level to support WSUCs with significant O&M activities which are beyond their financial or technical capacity.

There is no coordination between WSUC, VDC and DDC to support and sustain the completed projects. Supporting agencies handover the projects to Users, with little information provided to the local government agencies. As a result government have little accountability and take no responsibility for the continued functionality of the system. In conclusion, there is lack of an institutionally accepted monitoring mechanism to coordinate all stakeholders of the water sector for the sustainable operation of drinking water projects. In the absence of proper mechanism and supporting policy to WSUC there is increasing trend of failure projects in spite of increasing financial investment in the water sector.

4 Recommendations

Experiences of various stakeholders and the ground realities of the sector as a whole give us valuable learning to improve the drinking water sector significantly. Major recommendations for rationale allocation of resources and sustainable operation of drinking water projects are briefly discussed in the following section.

4.1 Focusing investment effectively

4.1.1 Social inclusion and access to services included in selection criteria
The Government of Nepal should take leadership in developing some clear criteria to guide project selection undertaken by Local Government and other sector implementing agencies. At the forefront of any Government criteria

should be to ensure that financial and technical support is focused on those communities made up of poor and socially excluded groups who have not been provided access to water services in the past. Project proposal should include information on the community members' social identity, such as ethnicity and caste, as well as information on access to basic services, including WASH, education and health care.

4.1.2. Recognition of investment in new, rehabilitation and replacement schemes
There is a need to increase awareness and equity of investment between new, rehabilitation and replacement water schemes. All project proposals should be classified in this category while planning

and budgeting to equity and to reduce duplication and repetition. Priority should be given to new schemes, in communities where water projects have been provided previously. Replacement schemes for those communities whose water schemes are dysfunctional and beyond their design lives should be given the next level of priority.

For those communities with dysfunctional schemes which are within their design life, careful review needs to be placed on the reasons for the systems not functioning. Those communities whose systems are not functioning due to external factors, such as natural disasters destroying infrastructure or poor initial design of the scheme, should be given priority over those schemes in which communities have not implemented an effective O&M system. In such scheme emphasis should be placed on rehabilitation rather than replacement, and the communities increased contribution (in cash and kind) and accountability place on them to maintain the new system sort.

4.1.3 District level Operation and Maintenance Fund

The establishment of an Operation and Maintenance Fund at district level to use exclusively for the repair and maintenance of drinking water projects would support the sustainability of schemes significantly. Use of this fund should be linked up with monitoring mechanism established

with the local bodies, as mentioned below, but the principle should be that fund are allocated to those communities that require financial or technical support which is beyond their capacity. Communities should be prioritised for the fund based on criteria that prove that they have been operating their system effectively. Communities should also be required to make a contribution to the O&M works that the fund is supporting. The availability of funds for this purpose at the district level will help user communities to meet their need of repair and maintenance beyond their capacity in a timely manner, prior to more significant investment and rehabilitation being required.

4.1.4 Establishment of Sector Wide Approach

Experience of drinking water sector over the decades suggests strongly that there should be a sector wide approach (SWAP) to allocate resources ensuring equity across the regions and communities. This will help for a well coordinated planning both at national and local levels. Implementation responsibilities of the projects will be assigned as per the capacity of different stakeholders. Problems of duplication and overlapping experienced should be eliminated. Uniformity among stakeholders in their operation modalities will ease user communities to approach their demands through local bodies and

enhanced ownership towards their project. It will help ultimately to take overall responsibility by local bodies for the caretaking of completed projects introducing comprehensive monitoring system in the district. Thus SWAP will be indispensable for the sustainable operation of drinking water sector as well as maintaining social equity to large extent.

4.2 Governance and monitoring

4.2.1 Redefining the roles of various actors at all levels

There is still ambiguity among the various stakeholders in their roles and responsibilities. Operation modalities are different among government, quasi-government and non government organizations. Local bodies, especially the DDC, have not been empowered as envisaged in decentralization act. This all has been resulted in uncoordinated planning, irrational resource allocation and improper maintenance of completed projects. District level WASH Coordination Committees, chaired by the LDO, and with representation from related government agencies and other non-government sector actors, need to be ignited. Part of the ignition process need to establish clear role and responsibilities of different actors, and also a coordination mechanism, which can oversee planning, implementation and monitoring of WASH activities.

4.2.2. Appropriate monitoring mechanism with local bodies

To enable District Level Stakeholders to better target the limited human and financial resources to those communities who are most of those at need and where maximum impact can be achieved, an effective District (and arguably VDC) level monitoring system must be in place. The system should includ information on current water coverage, scheme age and status, as well as information on who constructed them. Through an effective coordination mechanism all new schemes could be registered into the system too. This system would aid decisions on allocation on resources and also help to identify the sustainability of different organisations interventions and approaches. Establishment of “Data Bank and Information Centre” as envisaged in Rural Water Supply and Sanitation National Policy 2004 can be the milestone to initiate the appropriate monitoring mechanism at the local level.

4.2.3 Institutionalisation of Water Users Committee:

A process of registering all Water Users Committees with local bodies would increase their legitimacy and accountability. Registration of WUCs should take place in VDC, and in turn the VDC should register them DDC and District Administration Office. A

mechanism should be in place to monitor all WUCs, as to whether they are bearing their responsibility in a representative and transparent way. This mechanism would best sit with the VDC, but until these are strengthened might be better to reside with the DWSO. WUC should be monitored (and supported) concerning the best utilisation of the funds they received from various sources, as well as the O&M fund collected from their users. Linkage of the WUC with the local government bodies help to make them accountable publicly both to the users they represent and the VDC. To support gaps identified in WUCs there should be regular capacity building provided to face emerging issues of the sector, which are identified.

4.2.4 Strengthening the role of FEDWASUN

As mentioned the role of users is crucial in operating and maintaining of the drinking water schemes. Communities can also provide helpful information to Government and sector agencies on the underlying problems that hamper sustainable operations of projects. Increasing the networking and linkage between Users Groups, will both contribute towards shared learning and experience for the Users Groups and sector as a whole. The Federation of Water and Sanitation Users in Nepal (FEDWASUN) have a critical role in supporting such linkages and strengthening civil society's role in

supporting effective prioritisation and sustainability of water schemes. Through the recognition of the important role and legitimacy of FEDWASUN by local government bodies, FEDWASUN can play a key role in voicing the issues of User Groups and communities deprived of access to water within the District coordination mechanism.

FEDWASUN has come into existence relatively recently and therefore their capacity needs to be developed prior to too much expectation or pressure being placed on them. However in the long term there might be a role for them to support in district level monitoring activities and conducting social audits of completed projects. Similarly, FEDWASUN could be involved during planning and allocating fund for maintenance and rehabilitation of water schemes as it can give the true picture of the water coverage status.

4.3 Operational sustainability

4.3.1 Technical capacity of WUC

For the regular supervision of the water system from source to tap and carry out necessary operation technical capacity of the WUC is required to be reasonably strong. The presence of a trained Village Maintenance Workers (VMW) has provided to significantly increase the chance of sustainability of the scheme. It has also been shown that informal payment agreements

mean that VMW don't undertake their responsibilities effectively. Through the community formally employing the VMW on a contract basis their motivation and quality of work undertaken is increased.

It needs to be recognised that VMWs will leave the community, that existing VMW may require refresher training and that some problems will be beyond the technical capacity of the VMW. It is therefore important than a mechanism is in place to provide technical backstopping top VMWs to support them in their role, this would include refresher training. Technical backstopping could be provided in a number of ways; including through establishing a network of VMW at VDC or District level, through FEDWASUN raising issues at the District level or through

Government (DTO) or Local NGO agencies providing technical inputs.

4.3.2 Improved O&M approach and mechanism

Considering the shortcomings in operating projects in sustainable O&M approaches and mechanisms should be developed at all levels involving all stakeholders clarifying the roles and responsibilities of every actor. In this connection an O&M guideline for communities and local bodies should be developed. Users should be made more accountable to operate their own projects undertaking regular supervision and maintenance. Provision of O&M fund with the respective size of it and VMW, role of VDC and DDC should also be mentioned in the guidelines.

Annex

Followings were the list of schemes visited against each of the district:

District	New	Rehabilitation	Replacement
Sankhuwa Sabha	1. Jusmure WSWS, Jaljala VDC	2. Kharang WASH, Kharang VDC, 3. Raatmate WASH, Khandbari municipality 4. Dandagaon WASH, Khandbari municipality	
Baglung	5. Gahate WASH, Baglung municipality 6. Armaha WASH, Narayansthan VDC 7. Paiyupata WASH, Paiyapata VD 8. Damek WASHS, Damek VDC 9. Baskotpagja DWS, Payuthanthap VDC	10. Balewa Narayansthan WASH,Narayansthan VDC and Paiunpata VDC 11. Pala WASH, Banglung municipality 12. Biukot WASH, Biukot VDC	13. Bhimpokhara WASH, Bhim pokhara VDC
Dhading	14.Dhadingbesi WASH Scheme, Nilkantha VDC	15. Simle WASH scheme, Bhumesthan VDC 16. Krishnabhir WASH Scheme, Dhusa VDC 17. Pasupati WASH Scheme, Kailash VDC 18. Galchhi WASH Scheme, Baireni VDC	
Kaski		19. Dhikurpokhari-Kaskikot-Pokhari Sarangkot WASH, Dhikur VDC, Kaskikot VDC and Sarangkot VDC	



Research into financial and institutional structures to support the functionality and sustainability of rural hill water systems

The report reviews the equity of distribution of the investment and sustainability of rural hill water supply systems. It also explores the real situation and suggests ways that would significantly contribute to reforming the larger policy regime of the state concerning the institutional and sustainability factors that contribute to improving the functionality of drinking water systems in rural hill communities. Moreover, it attempts to suggest for the rational of allocation of available resources for drinking water that could be used for incremental development in the sector towards meeting the water needs of the people more equitably in the country.



WaterAid transforms lives by improving access to safe water, hygiene and sanitation in the world's poorest communities. We work with partners and influence decision-makers to maximise our impact.

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